IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor: Ravi Iyer
Attorney Docket No.: 400.083US03
Title: COMPOUND STRUCTURE FOR REDUCED CONTACT RESISTANCE

22151 U.S. PTO
10/689894

Mail Stop: PATENT APPLICATION
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Alexandria, VA 22313-1450

We are transmitting the following documents along with this Transmittal Sheet:

☒ Incorporate by Reference: *The entire disclosure of the prior application, from which a copy of the oath or declaration is supplied herewith, is considered as being part of the disclosure of the accompanying application and is hereby incorporated by reference therein.*

☒ **CONTINUATION** of prior Patent Application No. 09/858,617 filed May 16, 2001 under 37 CFR 1.53(b) comprising:

☒ Specification 29 pgs., including claims numbered 1-21 and a 1 page abstract;
☒ 7 Sheets of Formal drawings;
☒ A Communication Regarding Continuation Application (3 pgs.);
☒ A copy of the Declaration from prior application (4 pgs.);
☒ A copy of Power of Attorney from prior application (1 pg.);
☒ Prior application is assigned of record to: Micron Technology, Inc.;
☒ Information Disclosure Statement (1 pg.) and Form 1449 (1 pg.) (References not enclosed, cited in prior application);
☒ A check in the amount of $874.00 to cover the Large Entity filing fee, which is calculated below:

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CUSTOMER NUMBER 27073

APPLICATION FILING FEE					
	Number of Claims Filed (1)	Claims Included in Basic Filing Fee (2)	Number of Extra Claims (1-2)	Cost per Extra Claim	Fee Required
Total Claims	21	- 20 =	1	x $18.00 =	$18.00
Independent Claims	4	- 3 =	1	x $86.00 =	$86.00
One or More Multiple Dependent Claims Presented? If Yes, Enter $280 Here *					$
Enter Basic Filing Fee (Utility Patent-$770.00) Here *					$770.00
Total					
Total Application Filing Fee					**$874.00**

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Express Mail" mailing label number: EV 306296046 US Date of Deposit: October 21, 2003 These papers and fees are being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR §1.10 on the date indicated above and addressed to Mail Stop: Patent Application, Commissioner for Patents, P. O. Box 1450, Alexandria, VA 22313-1450.

(LARGE ENTITY TRANSMITTAL UNDER 37 C.F.R. 1.10)

First Named Inventor	Ravi Iyer	**COMMUNICATION REGARDING CONTINUATION APPLICATION**
Serial No.	Filed Herewith	
Filing Date	Filed Herewith	
Group Art Unit	Unknown	
Examiner Name	Unknown	
Confirmation No.	Unknown	
Attorney Docket No.	400.083US03	
Title: COMPOUND STRUCTURE FOR REDUCED CONTACT RESISTANCE		

Commissioner for Patents
BOX PATENT APPLICATION
Washington, D.C. 20231

The above-identified patent application is a continuation of U.S. Patent Application Serial No. 09/858,617 (allowed). In an Office Action mailed March 12, 2003 in the parent application, Examiner Roy Karl Potter rejected claims 1, 4, 5, 8, 15-18, 22-24 and 28 under 35 U.S.C. § 102 as being anticipated by U.S. Patent No. 5,654,235 issued August 5, 1997 to Matsumoto et al. This disputed subject matter was cancelled from the parent application without amendment or argument in order to allow undisputed subject matter to proceed to issuance without delay. Claims 1, 4, 5, 8, 15-18, 22-24 and 28 of U.S. Patent Application Serial No. 09/858,617 correspond to claims 1, 2, 3, 8, 11-14, 15-17 and 19, respectively, in the present continuation application. Applicant contends that the remaining claims of the present continuation application find support in the parent application and thus do not constitute new matter. Prior to examination of the present continuation application, Applicant requests that the Examiner consider the following remarks addressing the prior rejection.

Claim 1 recites, in part, "wherein the first refractory metal material contains the first impurity at a level less than a stoichiometric level" and "wherein the second refractory metal material has a lower affinity for the first and second impurities than does the first refractory metal material." Applicant contends that Matsumoto et al. does not teach or suggest at least these limitations. Matsumoto et al. purports to be modifying the crystalline structure of its titanium nitride layers and does not appear to concern itself with the nitrogen level of its first titanium nitride layer or the affinity of the nitrogen of either its first or second titanium nitride layer. *See, e.g.,* Matsumoto et al., column 4, lines 3-14. Accordingly, Applicant contends that

Matsumoto et al. cannot anticipate claim 1. As claims 2-7 depend from and further define claim 1, these claims are also believed to be allowable over the cited reference.

Claim 8 recites, in part, "a first refractory metal nitride layer overlying the silicon-containing material, wherein the first refractory metal nitride layer is an unsaturated refractory metal nitride material" and "a second refractory metal nitride layer overlying the first refractory metal nitride layer, wherein the second refractory metal nitride layer has a lower affinity for nitrogen than the first refractory metal nitride layer." As discussed with reference to claim 1, Applicant contends that Matsumoto et al. does not teach or suggest at least these limitations. Accordingly, Applicant contends that Matsumoto et al. cannot anticipate claim 8. As claims 9-16 depend from and further define claim 8, these claims are also believed to be allowable over the cited reference.

Claim 17 recites, in part, "a first refractory metal nitride layer overlying the silicon-containing material, wherein the first refractory metal nitride layer has a refractory metal component and wherein an atomic ratio of nitrogen to the refractory metal component of the first refractory metal nitride layer is less than one" and "a second refractory metal nitride layer overlying the first refractory metal nitride layer, wherein the second refractory metal nitride layer has a lower affinity for nitrogen than the first refractory metal nitride layer." As discussed with reference to claim 1, Applicant contends that Matsumoto et al. does not teach or suggest at least these limitations. Accordingly, Applicant contends that Matsumoto et al. cannot anticipate claim 17. As claim 18 depends from and further defines claim 17, this claim is also believed to be allowable over the cited reference.

Claim 19 recites, in part, "a titanium nitride layer overlying the silicon-containing material, wherein the titanium nitride layer is formed by reactive sputtering from a titanium target in a nitrogen-containing ambient to produce an unsaturated titanium nitride material having a bulk resistivity within 15% of a maximum unsaturated bulk resistivity." Applicant contends that Matsumoto et al. does not teach or suggest that its first titanium nitride layer be an unsaturated titanium nitride material or that it have a bulk resistivity within 15% of a maximum unsaturated bulk resistivity. Accordingly, Applicant contends that Matsumoto et al. cannot

anticipate claim 19. As claims 20-21 depend from and further define claim 19, these claims are also believed to be allowable over the cited reference.

In view of the foregoing remarks, Applicant contends that the claims are allowable and request allowance of the application.

Respectfully submitted,

Date: 21 Oct 03

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